

DATA SHEET

BSP126

N-channel enhancement mode
vertical D-MOS transistor

Product specification
File under Discrete Semiconductors, SC13b

April 1995

N-channel enhancement mode vertical D-MOS transistor

BSP126

DESCRIPTION

N-channel enhancement mode vertical D-MOS transistor in a miniature SOT223 envelope and designed for use as a line interrupter in telephone sets and for application in relay, high-speed and line-transformer drivers.

QUICK REFERENCE DATA

Drain-source voltage	V_{DS}	max.	250 V
Drain current (DC)	I_D	max.	350 mA
Total power dissipation up to $T_{amb} = 25\text{ }^\circ\text{C}$	P_{tot}	max.	1.5 W
Drain-source on-resistance $I_D = 300\text{ mA}; V_{GS} = 10\text{ V}$	$R_{DS(on)}$	typ. max.	5.0 Ω 7.0 Ω
Gate-source threshold voltage	$V_{GS(th)}$	max.	2 V

FEATURES

- Direct interface to C-MOS, TTL, etc.
- High-speed switching.
- No secondary breakdown.

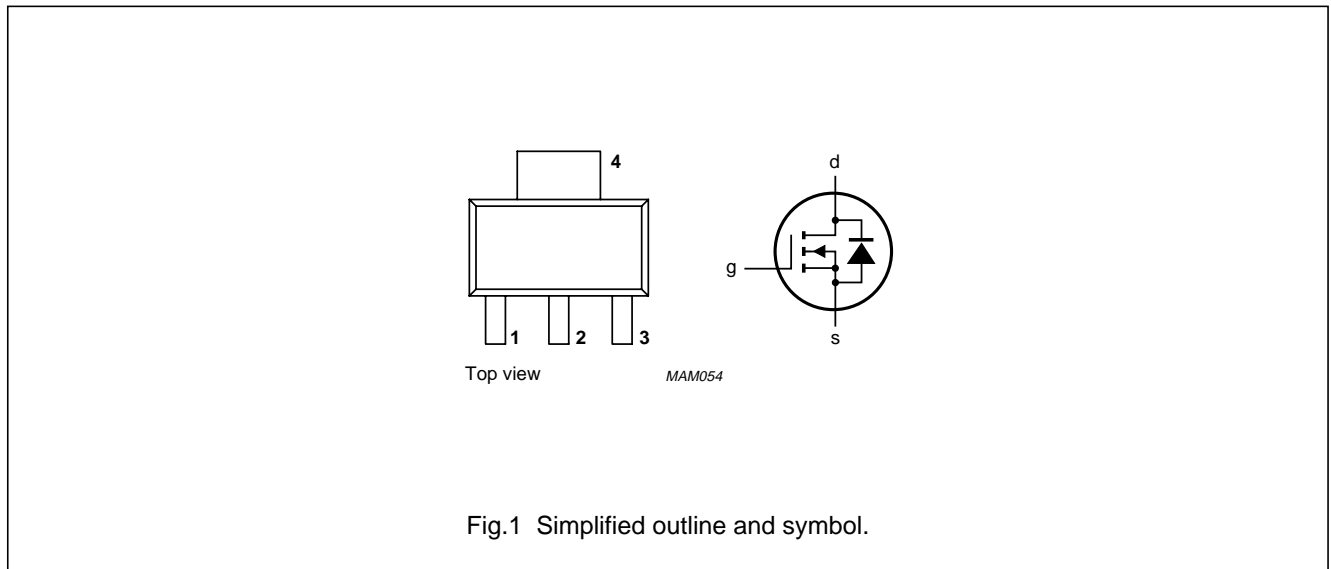
PINNING - SOT223

- 1 = gate
- 2 = drain
- 3 = source
- 4 = drain

Marking code

BSP126

PIN CONFIGURATION



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RATINGS

Limiting values in accordance with the Absolute Maximum System (IEC 134)

Drain-source voltage	V_{DS}	max.	250 V
Gate-source voltage (open drain)	$\pm V_{GSO}$	max.	20 V
Drain current (DC)	I_D	max.	350 mA
Drain current (peak)	I_{DM}	max.	1.2 A
Total power dissipation up to $T_{amb} = 25\text{ °C}$ (note 1)	P_{tot}	max.	1.5 W
Storage temperature range	T_{stg}		-65 to + 150 °C
Junction temperature	T_j	max.	150 °C

THERMAL RESISTANCE

From junction to ambient (note 1)	$R_{th\ j-a}$	=	83.3 K/W
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Note

1. Device mounted on an epoxy printed-circuit board 40 mm × 40 mm × 1.5 mm; mounting pad for the drain lead min. 6 cm².

CHARACTERISTICS

 $T_j = 25\text{ °C}$ unless otherwise specified

Drain-source breakdown voltage $I_D = 10\ \mu\text{A}; V_{GS} = 0$	$V_{(BR)DSS}$	min.	250 V
Drain-source leakage current $V_{DS} = 200\text{ V}; V_{GS} = 0$	I_{DSS}	max.	1.0 μA
Gate-source leakage current $\pm V_{GS} = 20\text{ V}; V_{DS} = 0$	$\pm I_{GSS}$	max.	100 nA
Gate threshold voltage $I_D = 1\text{ mA}; V_{DS} = V_{GS}$	$V_{GS(th)}$	min. max.	0.8 V 2.0 V
Drain-source on-resistance $I_D = 300\text{ mA}; V_{GS} = 10\text{ V}$	$R_{DS(on)}$	typ. max.	5.0 Ω 7.0 Ω
$I_D = 20\text{ mA}; V_{GS} = 2.4\text{ V}$	$R_{DS(on)}$	max.	10 Ω
Transfer admittance $I_D = 300\text{ mA}; V_{DS} = 25\text{ V}$	$ Y_{fs} $	min. typ.	200 mS 400 mS
Input capacitance at $f = 1\text{ MHz}$; $V_{DS} = 25\text{ V}; V_{GS} = 0$	C_{iss}	typ. max.	65 pF 90 pF
Output capacitance at $f = 1\text{ MHz}$; $V_{DS} = 25\text{ V}; V_{GS} = 0$	C_{oss}	typ. max.	20 pF 30 pF

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Feedback capacitance at $f = 1 \text{ MHz}$;

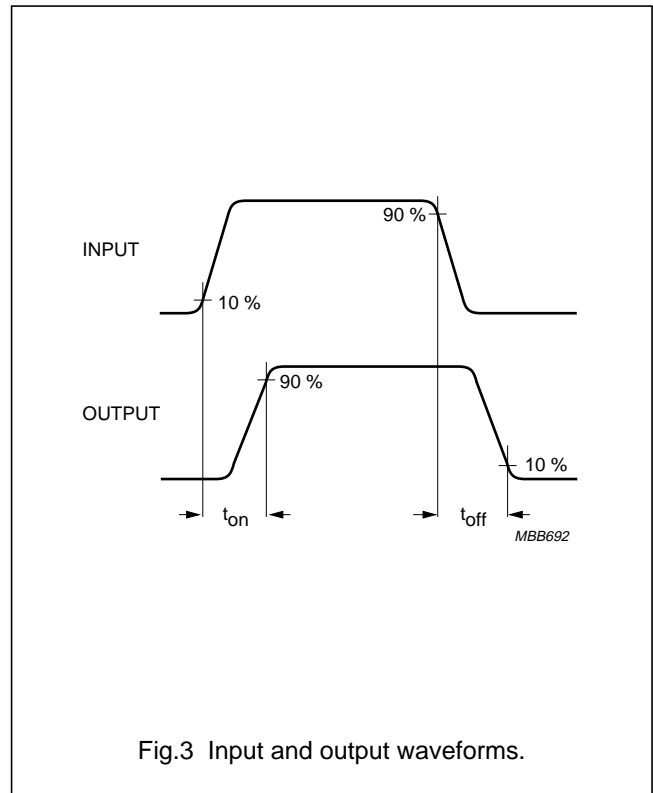
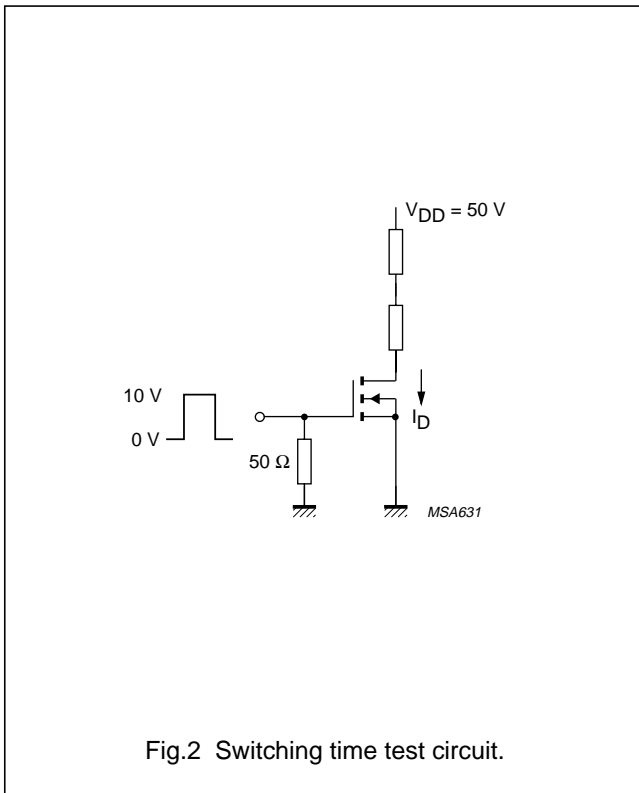
$V_{DS} = 25 \text{ V}$; $V_{GS} = 0$

C_{rss}	typ.	5 pF
	max.	15 pF

Switching times (see Figs 2 and 3)

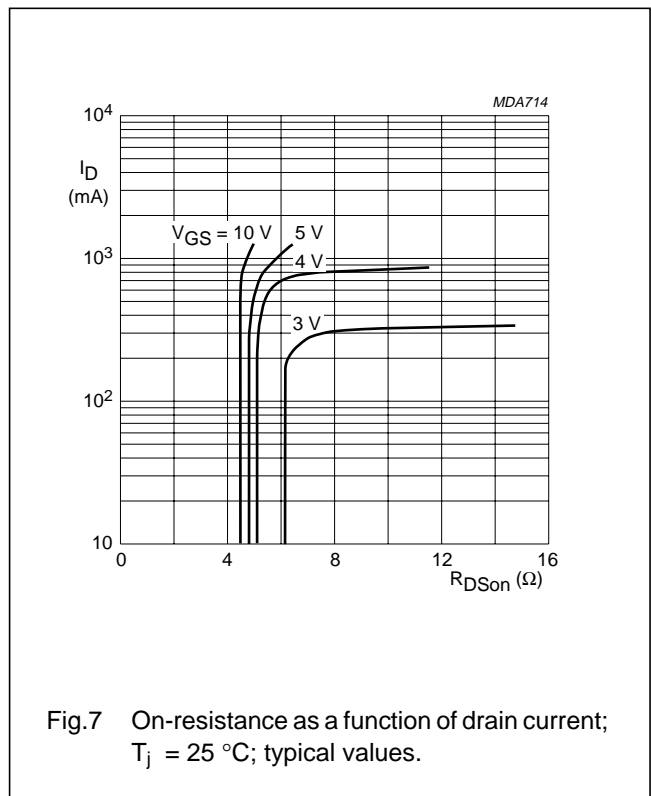
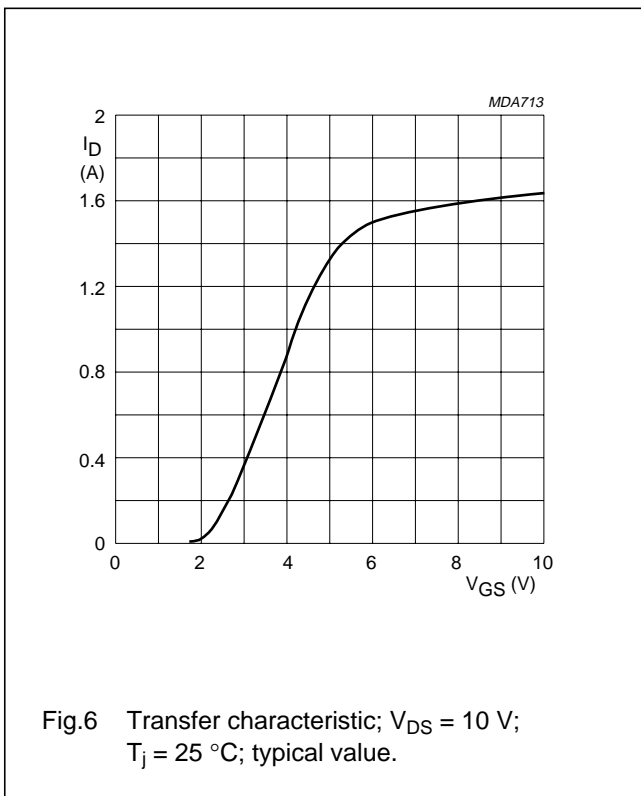
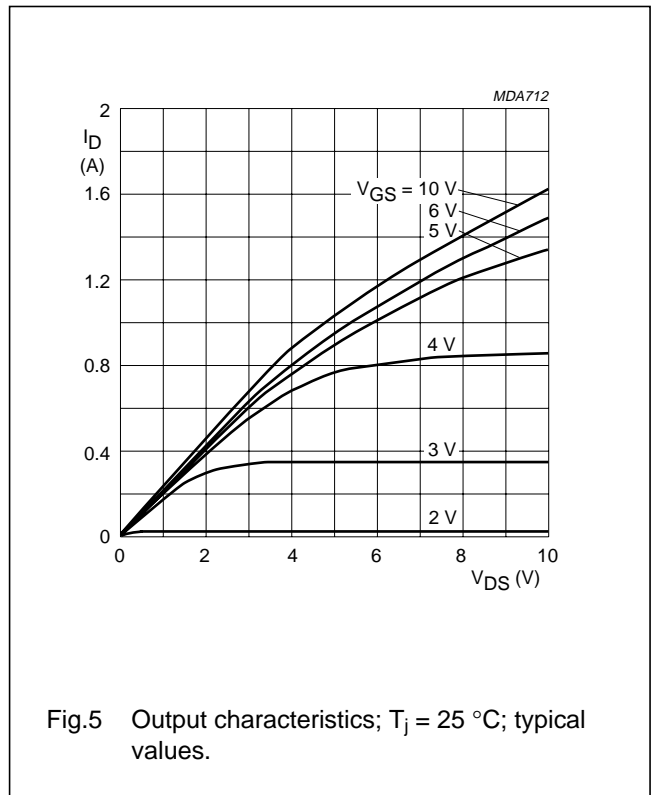
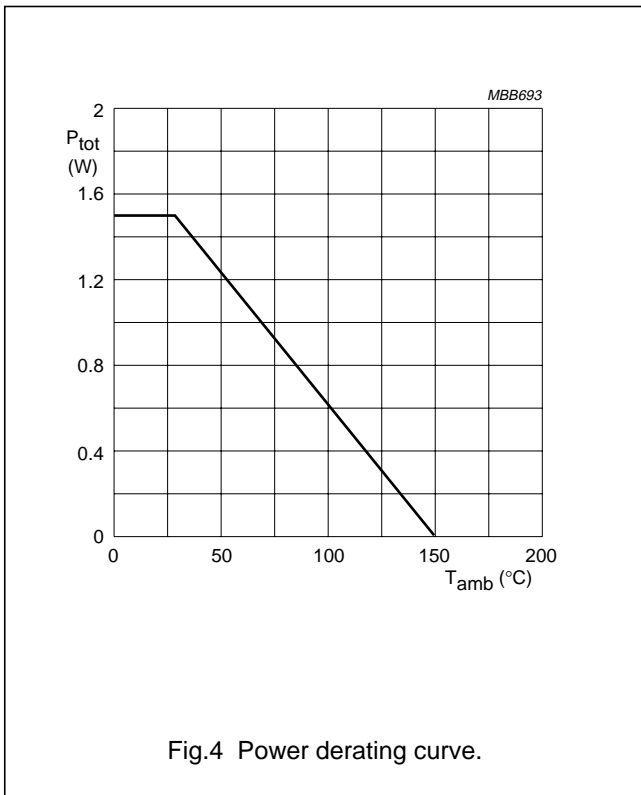
$I_D = 250 \text{ mA}$; $V_{DD} = 50 \text{ V}$;
 $V_{GS} = 0 \text{ to } 10 \text{ V}$

t_{on}	typ.	5 ns
	max.	10 ns
t_{off}	typ.	20 ns
	max.	30 ns



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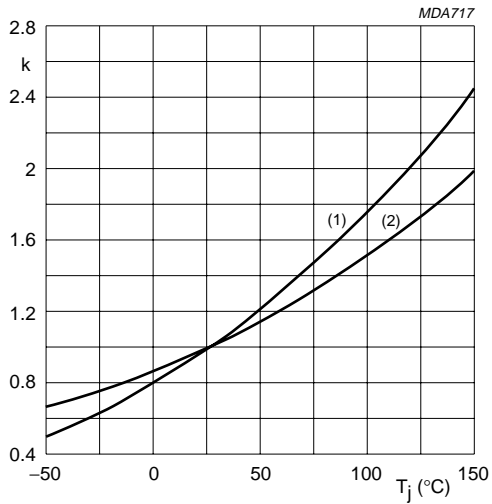


Fig.8 $k = \frac{R_{DS(on)} \text{ at } T_j}{R_{DS(on)} \text{ at } 25^\circ\text{C}}$; typical values.

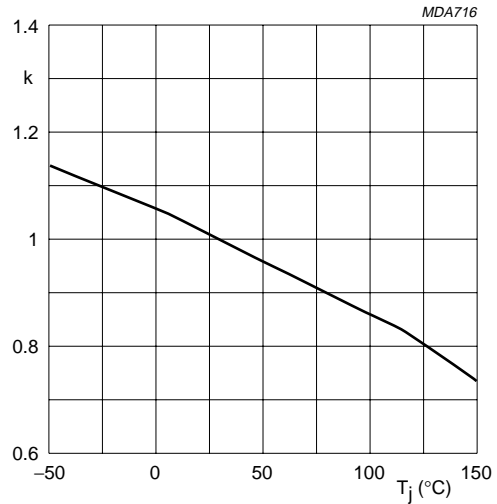


Fig.9 $k = \frac{V_{GS(th)} \text{ at } T_j}{V_{GS(th)} \text{ at } 25^\circ\text{C}}$; $V_{GS(th)}$ at 1 mA; typical values.

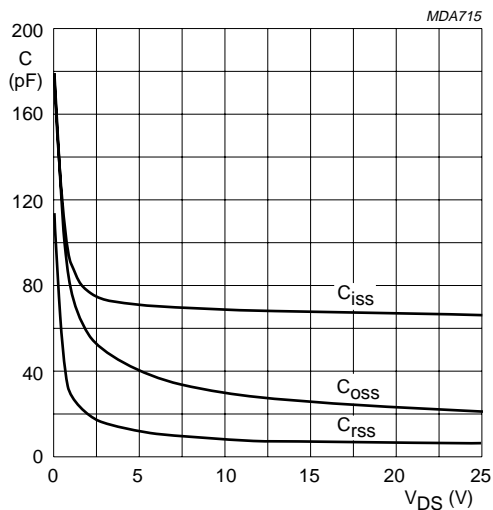


Fig.10 Capacitances as a function of drain-source voltage; $V_{GS} = 0$; $f = 1 \text{ MHz}$; $T_j = 25^\circ\text{C}$; typical values.

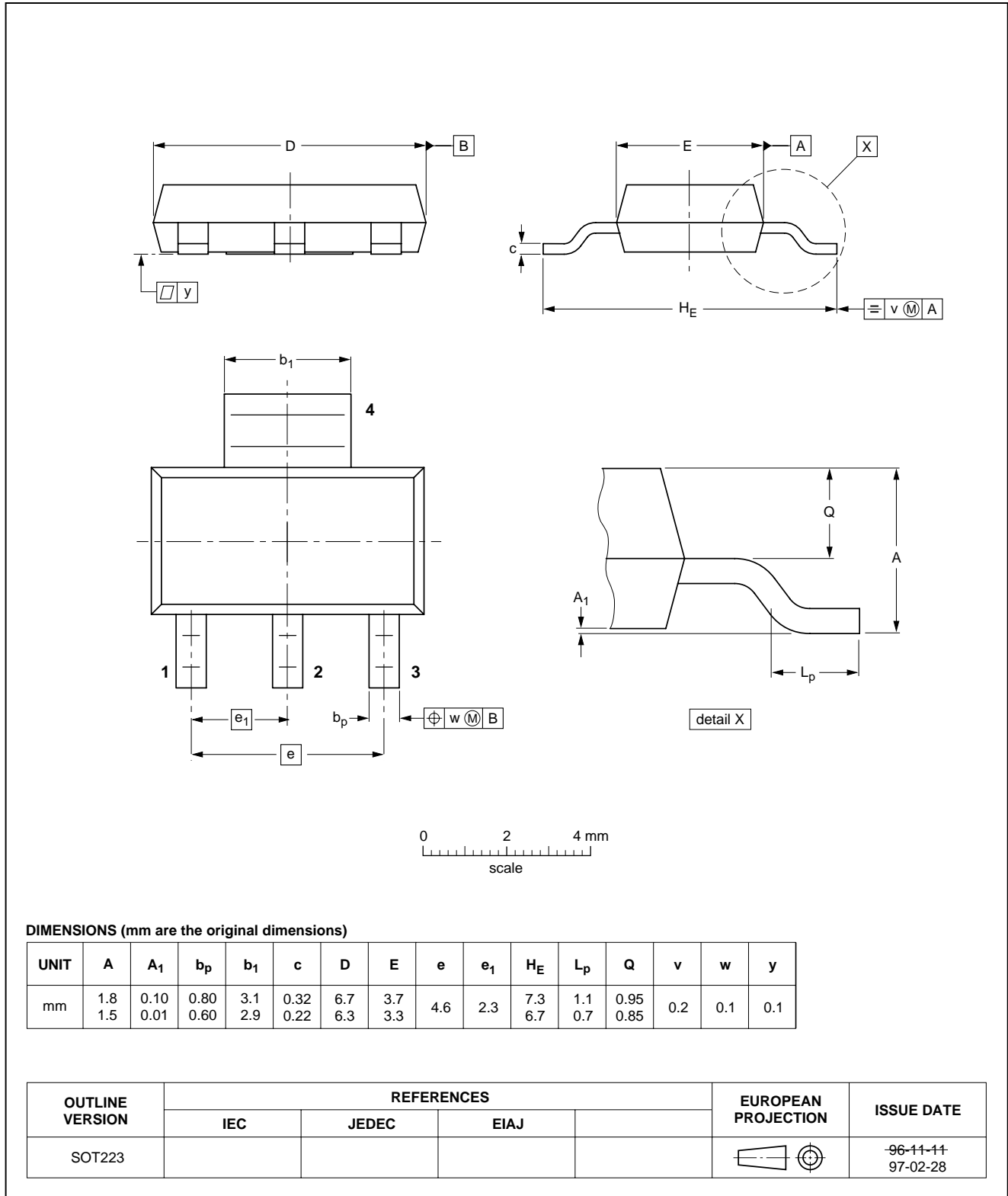
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PACKAGE OUTLINE

Plastic surface mounted package; collector pad for good heat transfer; 4 leads

SOT223



DIMENSIONS (mm are the original dimensions)

UNIT	A	A ₁	b _p	b ₁	c	D	E	e	e ₁	H _E	L _p	Q	v	w	y
mm	1.8 1.5	0.10 0.01	0.80 0.60	3.1 2.9	0.32 0.22	6.7 6.3	3.7 3.3	4.6	2.3	7.3 6.7	1.1 0.7	0.95 0.85	0.2	0.1	0.1

OUTLINE VERSION	REFERENCES				EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	EIAJ			
SOT223						96-11-11 97-02-28

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BSP126**DEFINITIONS**

Data sheet status	
Objective specification	This data sheet contains target or goal specifications for product development.
Preliminary specification	This data sheet contains preliminary data; supplementary data may be published later.
Product specification	This data sheet contains final product specifications.
Application information	
Where application information is given, it is advisory and does not form part of the specification.	

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NOTES

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Printed in The Netherlands

137107/1200/01/pp12

Date of release: April 1995

Document order number: 9397 750 02474

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